

AMENDMENTS TO CLAIMS

Claims 1-6 (Cancelled)

7. (Previously presented) A data storage device comprising a conductive probe having a tip; a substrate including a semiconductor portion; a data storage medium including a layer of poled ferroelectric material for storing data, the ferroelectric layer on the substrate, between the tip and the substrate, the semiconductor portion and the ferroelectric layer forming an electrical junction; and a protective layer covering the ferroelectric layer, the protective layer not interfering with interactions between the probe tip and the ferroelectric layer.

Claim 8 (Cancelled)

9. (Previously presented) A data storage device comprising a conductive probe having a tip; a substrate including a semiconductor portion; a data storage medium including a layer of poled ferroelectric material for storing data, the ferroelectric layer on the substrate, between the tip and the substrate, the semiconductor portion and the ferroelectric layer forming an electrical junction; and a circuit for causing the conductive probe to perform block and bulk erasure operations.

10. (Cancelled)

11. (Previously presented) A data storage device comprising a conductive probe having a tip; a substrate including a semiconductor portion; a data storage medium including a layer of poled ferroelectric material for storing data, the ferroelectric layer on the substrate, between the tip and the substrate, the semiconductor portion and the ferroelectric layer forming an electrical junction; and a read circuit for using the probe to sense changes in capacitance or leakage current of the junction.
12. (Previously presented) A data storage device comprising a conductive probe having a tip; a substrate including a semiconductor portion; a data storage medium including a layer of poled ferroelectric material for storing data, the ferroelectric layer on the substrate, between the tip and the substrate, the semiconductor portion and the ferroelectric layer forming an electrical junction; and a read circuit for using the probe to apply an ac signal to local areas on the ferroelectric material, and detect changes in a non-linear component of a dielectric constant.

Claims 13-27 (Cancelled)

28. (Previously presented) A method of reading information from a ferroelectric layer that is on a semiconductor substrate, and forms an electrical junction with the semiconductor substrate, the method comprising:
- scanning a surface of the ferroelectric layer with a probe having a sharp tip, the tip having a diameter of several nanometers; and
 - using the probe and the semiconductor substrate to detect polarity reversals at designated locations on the ferroelectric layer, each polarity reversal at a designated location indicating a first stored value at that

designated location, each non-reversal of polarity at an expected location indicating a second logic value stored at that designated location;

wherein the probe is used to sense changes in capacitance or leakage current of the junction.

29. (Previously presented) A method of reading information from a ferroelectric layer that is on a semiconductor substrate, and forms an electrical junction with the semiconductor substrate, the method comprising:

scanning a surface of the ferroelectric layer with a probe having a sharp tip, the tip having a diameter of several nanometers; and

using the probe and the semiconductor substrate to detect polarity reversals at designated locations on the ferroelectric layer, each polarity reversal at a designated location indicating a first stored value at that designated location, each non-reversal of polarity at an expected location indicating a second logic value stored at that designated location;

wherein the probe is used to apply an ac signal to local areas on the ferroelectric material, and wherein changes in a non-linear component of a dielectric constant are detected.

Claims 30-37 (Cancelled)